Amendments to the Claims:

Responsive to the Restriction Requirement mailed April 16, 2003, please cancel claims 7-9, 12, 17-18, 21-22, 24-26, and 29 without prejudice to, or disclaimer of, the subject matter contained therein.

1. (Currently Amended) An isolated nucleic acid molecule comprising a nucleotide sequence selected from the group consisting of:

(a) the nucleotide sequence shown in SEQ ID NO:1;

(b) a nucleotide sequence that encodes a polypeptide comprising the amino acid sequence of SEQ ID NO:2;

(c) ~~a nucleotide sequence encoding an MLH1 polypeptide, wherein said nucleotide sequence hybridizes to the nucleotide sequence shown in SEQ ID NO:1 under stringent conditions;~~

~~(d)~~ the cDNA insert of the plasmid deposited with ATCC as Patent Deposit No. PTA-2021; and

~~(e) a nucleotide sequence encoding an MLH1 polypeptide, wherein said nucleotide sequence hybridizes to the cDNA insert of the plasmid deposited with ATCC as Patent Deposit No. PTA-2021 under stringent conditions;~~

~~(f) a nucleotide sequence encoding an MLH1 polypeptide, said sequence having at least about 75% sequence identity to the nucleotide sequence shown in SEQ ID NO:1;~~

~~(g) a nucleotide sequence encoding an MLH1 polypeptide having at least about 75% sequence identity to the polypeptide encoded by the cDNA insert of the plasmid deposited with ATCC as Patent Deposit No. PTA-2021;~~

~~(h) a nucleotide sequence encoding an MLH1 polypeptide having at least about 75% sequence identity to the polypeptide sequence shown in SEQ ID NO:2; and~~

~~(i)~~(d) a nucleotide sequence comprising an antisense sequence corresponding to the nucleotide sequence in (a), (b), or (c)~~, (d), (e), (f), (g), or (h)~~.

2. (Original) An expression cassette comprising ~~a~~ the nucleic acid molecule of claim 1, wherein said nucleotide sequence is operably linked to a promoter that drives expression in a plant cell.

3. (Currently Amended) The expression cassette of claim 2, wherein said promoter is selected from the group consisting of constitutive, ~~chemically regulatable~~ chemically-inducible, and tissue-preferred promoters.

4. (Original) An isolated nucleic acid molecule comprising a fragment of SEQ ID NO:1, said fragment comprising at least 27 contiguous nucleotides of a nucleotide sequence selected from the group consisting of:

(a) nucleotides 1-2283 of the nucleotide sequence of SEQ ID NO:1; and

(b) nucleotides 1-2283 of the cDNA insert of the plasmid deposited with ATCC as Patent Deposit No. PTA-2021.

5. (Original) An isolated nucleic acid molecule comprising a nucleotide sequence selected from the group consisting of:

(a) a nucleotide sequence comprising at least 60 nucleotides that encodes a fragment of the amino acid sequence set forth in SEQ ID NO:2; and

(b) a nucleotide sequence comprising at least 60 nucleotides that encodes a fragment of the amino acid sequence encoded by the cDNA insert of the plasmid deposited with ATCC as Patent Deposit No. PTA-2021.

6. (Currently Amended) A host cell engineered to express ~~any one of~~ the isolated nucleic acid ~~molecules~~ molecule of claims 1, 4, or 5.

7-9. (Canceled)

10. (Currently Amended) A transformed plant comprising in its genome at least one stably incorporated expression cassette comprising a nucleotide sequence of claim 1.~~operably linked to a chemical-inducible promoter that drives expression in said plant cell, wherein said nucleotide sequence comprises a nucleotide sequence selected from the group consisting of:~~

~~(a) the nucleotide sequence shown in SEQ ID NO:1;~~

~~(b) a nucleotide sequence that encodes a polypeptide comprising the amino acid sequence of SEQ ID NO:2;~~

~~(c) a nucleotide sequence encoding an MLH1 polypeptide, wherein said nucleotide sequence hybridizes to the nucleotide sequence shown in SEQ ID NO:1 under stringent conditions;~~

~~(d) the cDNA insert of the plasmid deposited with ATCC as Patent Deposit No. PTA-2021;~~

~~(e) a nucleotide sequence encoding an MLH1 polypeptide, wherein said nucleotide sequence hybridizes to the cDNA insert of the plasmid deposited with ATCC as Patent Deposit No. PTA-2021 under stringent conditions;~~

~~(f) a nucleotide sequence encoding an MLH1 polypeptide, said sequence having at least about 75% sequence identity to the nucleotide sequence shown in SEQ ID NO:1;~~

~~(g) a nucleotide sequence encoding an MLH1 polypeptide having at least about 75% sequence identity to the polypeptide encoded by the cDNA insert of the plasmid deposited with ATCC as Patent Deposit No. PTA-2021;~~

~~(h) a nucleotide sequence encoding an MLH1 polypeptide having at least about 75% sequence identity to the polypeptide sequence shown in SEQ ID NO:2;~~

~~(i) a nucleotide sequence consisting of at least 27 consecutive nucleotides of nucleotides 1-2238 of (a) or (d); and~~

~~(j) a nucleotide sequence comprising an antisense sequence corresponding to the nucleotide sequence in (a), (b), (c), (d), (e), (f), (g), (h), or (i).~~

11. (Currently Amended) A transformed plant comprising in its genome:

(a) a first stably incorporated expression cassette comprising a nucleotide sequence operably linked to a promoter that drives expression in a plant cell, wherein said first expression cassette is located between two FRT sequences oriented to allow for inversion or excision of said first expression cassette by FLP recombinase, said nucleotide sequence comprising a nucleotide sequence of claim 1; and ~~selected from the group consisting of:~~

~~(i) the nucleotide sequence shown in SEQ ID NO:1;~~

~~(ii) a nucleotide sequence that encodes a polypeptide comprising the amino acid sequence of SEQ ID NO:2;~~

~~(iii) a nucleotide sequence encoding an MLH1 polypeptide, wherein said nucleotide sequence hybridizes to the nucleotide sequence shown in SEQ ID NO:1 under stringent conditions;~~

~~(iv) the cDNA insert of the plasmid deposited with ATCC as Patent Deposit No. PTA-2021;~~

~~(v) a nucleotide sequence encoding an MLH1 polypeptide, wherein said nucleotide sequence hybridizes to the cDNA insert of the plasmid deposited with ATCC as Patent Deposit No. PTA-2021 under stringent conditions;~~

~~(vi) a nucleotide sequence encoding an MLH1 polypeptide, said sequence having at least about 75% sequence identity to the nucleotide sequence shown in SEQ ID NO:1;~~

~~(vii) a nucleotide sequence encoding an MLH1 polypeptide having at least about 75% sequence identity to the polypeptide encoded by the cDNA insert of the plasmid deposited with ATCC as Patent Deposit No. PTA-2021;~~

~~(viii) a nucleotide sequence encoding an MLH1 polypeptide having at least about 75% sequence identity to the polypeptide sequence shown in SEQ ID NO:2;~~

~~(ix) a nucleotide sequence consisting of at least 27 consecutive nucleotides of nucleotides 1-2238 of (a) or (d); and~~

~~(x) a nucleotide sequence comprising an antisense sequence corresponding to the nucleotide sequence in (i), (ii), (iii), (iv), (v), (vi), (vii), (viii) or (ix); and~~

(b) a second stably incorporated expression cassette comprising a nucleotide sequence encoding said FLP recombinase operably linked to a chemical-inducible promoter that drives expression in said plant.

12. (Canceled)

13. (Currently Amended) A transformed plant comprising in its genome:

(a) a first stably incorporated expression cassette comprising a lexA DNA binding site embedded in a tissue-specific promoter that drives expression in a plant ~~cell~~, wherein said tissue-specific promoter is operably linked to a first nucleotide sequence comprising a nucleotide sequence of claim 1; and ~~selected from the group consisting of:~~

~~(i) the nucleotide sequence shown in SEQ ID NO:1;~~

~~(ii) a nucleotide sequence that encodes a polypeptide comprising the amino acid sequence of SEQ ID NO:2;~~

~~(iii) a nucleotide sequence encoding an MLH1 polypeptide, wherein said nucleotide sequence hybridizes to the nucleotide sequence shown in SEQ ID NO:1 under stringent conditions;~~

~~(iv) the cDNA insert of the plasmid deposited with ATCC as Patent Deposit No. PTA-2021;~~

~~(v) a nucleotide sequence encoding an MLH1 polypeptide, wherein said nucleotide sequence hybridizes to the cDNA insert of the plasmid deposited with ATCC as Patent Deposit No. PTA-2021 under stringent conditions;~~

~~(vi) a nucleotide sequence encoding an MLH1 polypeptide, said sequence having at least about 75% sequence identity to the nucleotide sequence shown in SEQ ID NO:1;~~

~~(vii) a nucleotide sequence encoding an MLH1 polypeptide having at least about 75% sequence identity to the polypeptide encoded by the cDNA insert of the plasmid deposited with ATCC as Patent Deposit No. PTA-2021;~~

~~(viii) a nucleotide sequence encoding an MLH1 polypeptide having at least about 75% sequence identity to the polypeptide sequence shown in SEQ ID NO:2;~~

~~(ix) a nucleotide sequence consisting of at least 27 consecutive nucleotides of nucleotides 1-2238 of (a) or (d); and~~

~~(x) a nucleotide sequence comprising an antisense sequence corresponding to the nucleotide sequence in (i), (ii), (iii), (iv), (v), (vi), (vii), (viii) or (ix); and~~

(b) a second stably incorporated expression cassette comprising of a second nucleotide sequence encoding a lexA repressor operably linked to a chemical-inducible promoter that drives expression in a plant ~~cell~~.

14. (Currently Amended) Transformed seed of the plant of any one of claims 10, 11, ~~12,~~ or 13.

15. (Currently Amended) The transformed plant of any one of claims 10, 11, ~~12,~~ or 13, wherein said plant is a monocot.

16. (Original) The transformed plant of claim 15, wherein said monocot is rice, maize, wheat, barley, sorghum, or rye.

17-18. (Canceled)

19. (Currently Amended) A method for increasing the efficiency of targeted gene mutation or homologous recombination in a plant, said method comprising:

(a) transforming said plant with at least one expression cassette comprising a nucleotide sequence operably linked to a chemical-inducible promoter that drives expression in a plant ~~cell~~, wherein said nucleotide sequence comprises a nucleotide sequence of claim 1~~selected from the group consisting of:~~

~~(i) the nucleotide sequence shown in SEQ ID NO:1;~~

~~(ii) a nucleotide sequence that encodes a polypeptide comprising the amino acid sequence of SEQ ID NO:2;~~

~~(iii) a nucleotide sequence encoding an MLH1 polypeptide, wherein said nucleotide sequence hybridizes to the nucleotide sequence shown in SEQ ID NO:1 under stringent conditions;~~

~~(iv) the cDNA insert of the plasmid deposited with ATCC as Patent Deposit No. PTA-2021;~~

~~(v) a nucleotide sequence encoding an MLH1 polypeptide, wherein said nucleotide sequence hybridizes to the cDNA insert of the plasmid deposited with ATCC as Patent Deposit No. PTA-2021 under stringent conditions;~~

~~(vi) a nucleotide sequence encoding an MLH1 polypeptide, said sequence having at least about 75% sequence identity to the nucleotide sequence shown in SEQ ID NO:1;~~

~~(vii) a nucleotide sequence encoding an MLH1 polypeptide having at least about 75% sequence identity to the polypeptide encoded by the cDNA insert of the plasmid deposited with ATCC as Patent Deposit No. PTA-2021;~~

~~(viii) a nucleotide sequence encoding an MLH1 polypeptide having at least about 75% sequence identity to the polypeptide sequence shown in SEQ ID NO:2;~~

~~(ix) a nucleotide sequence consisting of at least 27 consecutive nucleotides of nucleotides 1-2238 of (a) or (d); and~~

~~(x) a nucleotide sequence comprising an antisense sequence corresponding to the nucleotide sequence in (i), (ii), (iii), (iv), (v), (vi), (vii), (viii) or (ix)~~;

(b) transforming said plant with a nucleic acid molecule comprising a nucleotide sequence selected from the group consisting of a nucleotide sequence having at least one desired mutation ~~or~~ and a nucleotide sequence having at least one nucleotide sequence to be homologously recombined, wherein said transforming occurs in the presence of a chemical compound capable of inducing said chemical-inducible promoter, whereby said plant's cellular mismatch repair system is inhibited; and

(c) selecting said transformed ~~plants~~ plant that contain said mutation or said homologously recombined nucleotide sequence.

20. (Currently Amended) A method for increasing the efficiency of targeted gene mutation or homologous recombination in a plant, said method comprising:

(a) transforming said plant with a first expression cassette comprising a nucleotide sequence operably linked to a first chemical-inducible promoter that drives expression in a plant ~~cell~~, wherein said first expression cassette is located between two FRT sequences oriented to allow for inversion or excision of said first expression cassette by FLP recombinase; wherein said nucleotide sequence comprises a nucleotide sequence of claim 1 ~~is selected from the group consisting of:~~

~~(i) the nucleotide sequence shown in SEQ ID NO:1;~~

~~(ii) a nucleotide sequence that encodes a polypeptide comprising the amino acid sequence of SEQ ID NO:2;~~

~~(iii) a nucleotide sequence encoding an MLH1 polypeptide, wherein said nucleotide sequence hybridizes to the nucleotide sequence shown in SEQ ID NO:1 under stringent conditions;~~

~~(iv) the cDNA insert of the plasmid deposited with ATCC as Patent Deposit No. PTA-2021;~~

~~(v) a nucleotide sequence encoding an MLH1 polypeptide, wherein said nucleotide sequence hybridizes to the cDNA insert of the plasmid deposited with ATCC as Patent Deposit No. PTA-2021 under stringent conditions;~~

~~(vi) a nucleotide sequence encoding an MLH1 polypeptide, said sequence having at least about 75% sequence identity to the nucleotide sequence shown in SEQ ID NO:1;~~

~~(vii) a nucleotide sequence encoding an MLH1 polypeptide having at least about 75% sequence identity to the polypeptide encoded by the cDNA insert of the plasmid deposited with ATCC as Patent Deposit No. PTA-2021;~~

~~(viii) a nucleotide sequence encoding an MLH1 polypeptide having at least about 75% sequence identity to the polypeptide sequence shown in SEQ ID NO:2;~~

~~(ix) a nucleotide sequence consisting of at least 27 consecutive nucleotides of nucleotides 1-2238 of (a) or (d); and~~

~~(x) a nucleotide sequence comprising an antisense sequence corresponding to the nucleotide sequence in (i), (ii), (iii), (iv), (v), (vi), (vii), (viii) or (ix);~~

(b) transforming said plant with a second expression cassette comprising a nucleotide sequence encoding said FLP recombinase operably linked to a second chemical-inducible promoter that drives expression in said plant;

(c) transforming said plant with a nucleic acid molecule comprising a nucleotide sequence selected from the group consisting of a nucleotide sequence having at least one desired mutation ~~or~~ and a nucleotide sequence having at least one nucleotide sequence to be homologously recombined in the presence of a first chemical compound capable of inducing expression by said first chemical-inducible promoter, whereby said plant's cellular mismatch repair system is inhibited;

(d) contacting said plant with a second chemical compound capable of inducing expression of said second chemical-inducible promoter thereby inducing expression of FLP recombinase to release said inhibition of the cellular mismatch repair system; and

(e) selecting said transformed ~~plants~~ plant containing said mutation or said homologously recombined nucleotide sequence.

21-22. (Canceled)

23. (Currently Amended) The method of any one of claims ~~17, 19, 20, 21, or 22,~~ 19 or 20 wherein said nucleic acid molecule comprising the nucleotide sequence having the desired mutation or the nucleotide sequence to be homologously recombined is that of a species different from said plant being transformed, whereby a hybrid plant species is formed.

24-26. (Canceled)

27. (Currently Amended) A method for producing reversible male sterility in a plant, said method comprising:

(a) transforming a plant with a first expression cassette comprising of a lexA DNA binding site embedded in a tissue-specific promoter that drives expression in said plant operably linked to a first nucleotide sequence that when expressed disrupts pollen formation or function through inhibition of said plant's cellular mismatch repair system, wherein said first nucleotide sequence comprises a nucleotide sequence of claim 1 ~~is selected from the group consisting of:~~

~~(i) the nucleotide sequence shown in SEQ ID NO:1;~~

~~(ii) a nucleotide sequence that encodes a polypeptide comprising the amino acid sequence of SEQ ID NO:2;~~

~~(iii) a nucleotide sequence encoding an MLH1 polypeptide, wherein said nucleotide sequence hybridizes to the nucleotide sequence shown in SEQ ID NO:1 under stringent conditions;~~

~~(iv) the cDNA insert of the plasmid deposited with ATCC as Patent Deposit No. PTA-2021;~~

~~(v) a nucleotide sequence encoding an MLH1 polypeptide, wherein said nucleotide sequence hybridizes to the cDNA insert of the plasmid deposited with ATCC as Patent Deposit No. PTA-2021 under stringent conditions;~~

~~(vi) a nucleotide sequence encoding an MLH1 polypeptide, said sequence having at least about 75% sequence identity to the nucleotide sequence shown in SEQ ID NO:1;~~

~~(vii) a nucleotide sequence encoding an MLH1 polypeptide having at least about 75% sequence identity to the polypeptide encoded by the cDNA insert of the plasmid deposited with ATCC as Patent Deposit No. PTA-2021;~~

~~(viii) a nucleotide sequence encoding an MLH1 polypeptide having at least about 75% sequence identity to the polypeptide sequence shown in SEQ ID NO:2;~~

~~(ix) a nucleotide sequence consisting of at least 27 consecutive nucleotides of nucleotides 1-2238 of (a) or (d); and~~

~~(x) a nucleotide sequence comprising an antisense sequence corresponding to the nucleotide sequence in (i), (ii), (iii), (iv), (v), (vi), (vii), (viii) or (ix);~~

~~(c)~~ (b) transforming said plant with a second expression cassette comprising a second nucleotide sequence encoding a lexA repressor protein operably linked to a chemical-inducible promoter that drives expression in said plant; and

~~(d)~~ (c) exposing said plant to a chemical compound capable of inducing said chemical-inducible promoter, thereby inducing expression of said lexA repressor protein, whereby inhibition of the cellular mismatch repair system is released and said male sterility is reversed.

28. (Original) The method of claim 27, wherein said tissue-specific promoter is an anther-specific promoter and said chemical-inducible promoter is a herbicidal safener.

29. (Canceled)

Please add the following new claims 30-33:

30. (New) An isolated nucleic acid molecule comprising a nucleotide sequence selected from the group consisting of:

(a) a nucleotide sequence encoding an MLH1 polypeptide, said sequence having at least about 85% sequence identity to the nucleotide sequence shown in SEQ ID NO:1 and wherein said polypeptide has mismatch repair activity;

(b) a nucleotide sequence encoding an MLH1 polypeptide having at least about 85% sequence identity to the polypeptide encoded by the cDNA insert of the plasmid deposited with ATCC as Patent Deposit No. PTA-2021 and wherein said polypeptide has mismatch repair activity;

(c) a nucleotide sequence encoding an MLH1 polypeptide having at least about 85% sequence identity to the polypeptide sequence shown in SEQ ID NO:2 and mismatch repair activity;

(d) a nucleotide sequence comprising an antisense sequence corresponding to the nucleotide sequence in (a), (b), or (c).

31. (New) The nucleic acid molecule of claim 30, wherein the nucleotide sequence is selected from the group consisting of:

(a) a nucleotide sequence encoding an MLH1 polypeptide, said sequence having at least about 90% sequence identity to the nucleotide sequence shown in SEQ ID NO:1 and wherein said polypeptide has mismatch repair activity;

(b) a nucleotide sequence encoding an MLH1 polypeptide having at least about 90% sequence identity to the polypeptide encoded by the cDNA insert of the plasmid deposited with ATCC as Patent Deposit No. PTA-2021 and wherein said polypeptide has mismatch repair activity;

(c) a nucleotide sequence encoding an MLH1 polypeptide having at least about 90% sequence identity to the polypeptide sequence shown in SEQ ID NO:2 and mismatch repair activity;

(d) a nucleotide sequence comprising an antisense sequence corresponding to the nucleotide sequence in (a), (b), or (c).

32. (New) The nucleic acid molecule of claim 30, wherein the nucleotide sequence is selected from the group consisting of:

(a) a nucleotide sequence encoding an MLH1 polypeptide, said sequence having at least about 95% sequence identity to the nucleotide sequence shown in SEQ ID NO:1 and wherein said polypeptide has mismatch repair activity;

(b) a nucleotide sequence encoding an MLH1 polypeptide having at least about 95% sequence identity to the polypeptide encoded by the cDNA insert of the plasmid deposited with ATCC as Patent Deposit No. PTA-2021 and wherein said polypeptide has mismatch repair activity;

(c) a nucleotide sequence encoding an MLH1 polypeptide having at least about 95% sequence identity to the polypeptide sequence shown in SEQ ID NO:2 and mismatch repair activity;

(d) a nucleotide sequence comprising an antisense sequence corresponding to the nucleotide sequence in (a), (b), or (c).

33. (New) An isolated nucleic acid molecule comprising a nucleotide sequence selected from the group consisting of:

(a) a nucleotide sequence encoding an MLH1 polypeptide, wherein said nucleotide sequence hybridizes to the nucleotide sequence shown in SEQ ID NO:1 under stringent conditions and wherein said polypeptide has mismatch repair activity and wherein said stringent conditions comprise hybridization in 50% formamide, 1 M NaCl, 1% SDS at 37°C, and a wash in 0.1X SSC at 60 to 65°C;

(b) a nucleotide sequence encoding an MLH1 polypeptide, wherein said nucleotide sequence hybridizes to the cDNA insert of the plasmid deposited with ATCC as Patent Deposit No. PTA-2021 under stringent conditions and wherein said polypeptide has mismatch repair activity and wherein said stringent conditions comprise hybridization in 50% formamide, 1 M NaCl, 1% SDS at 37°C, and a wash in 0.1X SSC at 60 to 65°C; and

(c) a nucleotide sequence comprising an antisense sequence corresponding to the nucleotide sequence in (a) or (b).